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Term: L32 and (RFID)

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Search History

DATE: Saturday, March 12, 2005 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L33	L32 and (RFID)	4	L33
L32	L28 and (java near servlet)	4	L32
L31	L28 and java	329	L31
L30	L29 and java	2	L30
L29	L28 and (interaction near database)	10	L29
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L27	L25 and (interaction near database)	0	L27
DB=USPT; PLUR=YES; OP=OR			
L26	L25 and (interaction near database)	0	L26
L25	253/$.ccls.	0	L25
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L24	L23 and interaction	4	L24
L23	(java near servlet) and (RFID near tag)	14	L23
L22	L21 and (java)	0	L22
L21	L20 or (6526158.pn.)	4	L21
L20	(6259367.pn.)	2	L20
L19	l4 and (interaction near database)	0	L19
L18	L17	0	L18

DB=USPT; PLUR=YES; OP=OR

L17	l8 and (interaction near database)	0	L17
L16	l4 and (java)	0	L16
L15	l7 and (java)	0	L15
L14	l8 and (java)	0	L14
L13	l10 and (java)	0	L13
L12	l10 and (java near servlet)	0	L12
L11	l10 and (interaction near identification)	0	L11
L10	L9 and software	4	L10
L9	L8 and object	4	L9
L8	L7 and interaction	6	L8
L7	L6 and (RFID near code)	36	L7
L6	L4 and (code)	148	L6
L5	L4 and (idenfication near code)	0	L5
L4	L2 and (RFID near tag)	179	L4
L3	L2 and (RFID near tag$)	166	L3
L2	RFID near reader	227	L2
L1	FRID near reader	0	L1

END OF SEARCH HISTORY

L33: Entry 4 of 4 File: USPT May 11, 2004

DOCUMENT-IDENTIFIER: US 6732933 B2
TITLE: Coupling of bar code data readers to mobile terminals operable in wireless networks

Detailed Description Text (7):
Various other types of portable terminals may be advantageously employed in a system having features of the invention; these portable terminals ordinarily could utilize data entry media such as keyboards, touchscreens, a magnetic cards, RFID tags, biometric sources, SIM devices, smart cards, electronic key (e.g. "Ving") access cards, or the like, as well as a display (or printer) for providing a display of the information detected, transmitted and/or received by the terminal. In this embodiment used as an illustrative example, there may be from one up to sixty-four of the base stations (three stations being shown in the Figure) and up to several hundred of the remote portable units; of course, the network is scalable and may be expanded by merely changing the size of address fields and the like in the digital system, as will appear, but a limiting factor is the RF traffic and attendant delays in waiting for a quiet channel.

Detailed Description Text (9):
The network may also include a server 95 which may be associated with an Internet site, and may include a plurality of software components that can be accessed by an agent program. Such components may include one or more object classes including applets, servlets, Java Beans (TM) etc. or in general any executable unit of code.

Current US Original Classification (1):
235/462.25

L24: Entry 2 of 4 File: PGPB Jul 31, 2003

PGPUB-DOCUMENT-NUMBER: 20030144926
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030144926 A1

TITLE: Inventory controls with radio frequency identification

PUBLICATION-DATE: July 31, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bodin, William Kress	Austin	TX	US	
Thorson, Derral Charles	Austin	TX	US	
Shah, Parag Himanshu	Austin	TX	US	

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
INTERNATIONAL BUSINESS MACHINES CORPORATION	ARMONK	NY		02

APPL-NO: 10/ 062325 [PALM]
DATE FILED: January 31, 2002

INT-CL: [07] G06 F 17/60

US-CL-PUBLISHED: 705/28
US-CL-CURRENT: 705/28

REPRESENTATIVE-FIGURES: 1

ABSTRACT:

Inventory control with inventory item attributes wherein the attributes describe an inventory item, the inventory item has an RFID identification tag having an RFID identification tag code, and the inventory item attributes include an RFID identification tag code field, a control value, an acceptable control value range, and an out of range action. Detecting changes in the inventory item attributes, including reading, through an RFID reader, the RFID identification code from the RFID tag associated with the inventory item, recording detected changes in inventory item attributes, comparing the control value and the acceptable control value range, and taking action in dependence upon the result of the comparing and the out of range action.

L24: Entry 1 of 4 File: PGPB Aug 21, 2003

PGPUB-DOCUMENT-NUMBER: 20030158974
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030158974 A1

TITLE: Software method for emulating a serial port between applications for enabling communications by mobile bar code readers and computer terminals in wireless networks

PUBLICATION-DATE: August 21, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Herrod, Allan	Mission Viejo	CA	US	
Croley, Curt	Stony Brook	NY	US	
Fuccello, James	Patchogue	NY	US	
Trask, Ted	Melville	NY	US	
Schaefer, Donald	Wantagh	NY	US	
Bhatia, Sudhir	Brooklyn	NY	US	

APPL-NO: 10/ 079972 [PALM]
DATE FILED: February 20, 2002

INT-CL: [07] G06 F 9/00, G06 F 9/46

US-CL-PUBLISHED: 709/328
US-CL-CURRENT: 719/328

REPRESENTATIVE-FIGURES: 4

ABSTRACT:

An application program interface in a computer for allowing application programs executing in the computer to access a wireless RF input/output facility or port in the computer, which emulates a serial port in the computer by the steps of opening a handle to a virtual COM port from an application program executing in the computer; opening and configuring a serial port by the application program; starting a thread to receive characters to be communicated through the RF facility; and utilizing the virtual COM port to open a component interface to allow communications through wireless RF communications.

1. REFERENCE TO RELATED APPLICATIONS

[0001] This application is related to copending U.S. patent application Ser. No. 09/967,358 filed Sep. 28, 2001.

[0002] This application is related to copending U.S. patent application Ser. No. 09/686,755 filed Oct. 10, 2000, which is a divisional of Ser. No. 09/166,816, filed Oct. 5, 1998.

[0003] This application is also related to copending U.S. patent Ser. No. 09/823,208 filed Mar. 30, 2001, which is a division of Ser. No. 09/107,838, filed Jun. 30, 1998, now U.S. Pat. No.

6,237,053.

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Search Results - Record(s) 1 through 4 of 4 returned.

☐ 1. Document ID: US 20030158974 A1

Using default format because multiple data bases are involved.

L24: Entry 1 of 4 File: PGPB Aug 21, 2003

PGPUB-DOCUMENT-NUMBER: 20030158974
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030158974 A1

TITLE: Software method for emulating a serial port between applications for enabling communications by mobile bar code readers and computer terminals in wireless networks

PUBLICATION-DATE: August 21, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Herrod, Allan	Mission Viejo	CA	US	
Croley, Curt	Stony Brook	NY	US	
Fuccello, James	Patchogue	NY	US	
Trask, Ted	Melville	NY	US	
Schaefer, Donald	Wantagh	NY	US	
Bhatia, Sudhir	Brooklyn	NY	US	

US-CL-CURRENT: 719/328

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20030144926 A1

L24: Entry 2 of 4 File: PGPB Jul 31, 2003

PGPUB-DOCUMENT-NUMBER: 20030144926
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030144926 A1

TITLE: Inventory controls with radio frequency identification

PUBLICATION-DATE: July 31, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bodin, William Kress	Austin	TX	US	
Thorson, Derral Charles	Austin	TX	US	
Shah, Parag Himanshu	Austin	TX	US	

US-CL-CURRENT: 705/28

☐ 3. Document ID: US 20030038172 A1

L24: Entry 3 of 4 File: PGPB Feb 27, 2003

PGPUB-DOCUMENT-NUMBER: 20030038172
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030038172 A1

TITLE: Detecting interactions via intelligent gateway

PUBLICATION-DATE: February 27, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bodin, William Kress	Austin	TX	US	
Thorson, Derral Charles	Austin	TX	US	
Shah, Parag Himanshu	Austin	TX	US	

US-CL-CURRENT: 235/100

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 4. Document ID: US 20030038172 A1

L24: Entry 4 of 4 File: DWPI Feb 27, 2003

DERWENT-ACC-NO: 2003-466388
DERWENT-WEEK: 200344

TITLE: Object interaction detection method for tracking heavy machinery, trucks, involves identifying radio frequency identification code from tags associated with objects and using it for referring database using Java servlets

INVENTOR: BODIN, W K; SHAH, P H ; THORSON, D C

PRIORITY-DATA: 2001US-0935398 (August 23, 2001)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 20030038172 A1	February 27, 2003		011	G07G001/00

INT-CL (IPC): G07 G 1/00

ABSTRACTED-PUB-NO: US20030038172A
BASIC-ABSTRACT:

NOVELTY - The value indicating interaction between objects are identified and stored as interaction record in the radio frequency identification (RFID) fields of interaction database. The RFID codes from the tags associated with the objects are read and the interaction between the objects are determined by referring the database using Java servlets in an open service gateway initiative (OSGI) compliant service bundle.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) object interaction detection system; and

(2) computer program product for detecting interaction between objects associated with RFID tag.

USE - For tracking animal, intermodal containers, heavy machinery, trucks, cars, food packages in cash register of fast food restaurant, various applications in manufacturing operations, checking surgical tool sets in hospital operation theaters, for detecting various articles carried by a person through RFID antenna, etc.

ADVANTAGE - Identifies the objects and interactions among the object at same time, regardless of the exact physical orientation of the objects with respect to a reader.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of the object interaction detection apparatus.

Term	Documents
INTERACTION	384162
INTERACTIONS	129518
(23 AND INTERACTION).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	4
(L23 AND INTERACTION).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	4

L24: Entry 2 of 4 File: PGPB Jul 31, 2003

DOCUMENT-IDENTIFIER: US 20030144926 A1
TITLE: Inventory controls with radio frequency identification

Abstract Paragraph:
Inventory control with inventory item attributes wherein the attributes describe an inventory item, the inventory item has an RFID identification tag having an RFID identification tag code, and the inventory item attributes include an RFID identification tag code field, a control value, an acceptable control value range, and an out of range action. Detecting changes in the inventory item attributes, including reading, through an RFID reader, the RFID identification code from the RFID tag associated with the inventory item, recording detected changes in inventory item attributes, comparing the control value and the acceptable control value range, and taking action in dependence upon the result of the comparing and the out of range action.

Summary of Invention Paragraph:
[0005] Exemplary embodiments of the invention include a method of inventory control, typically including providing inventory item attributes comprising data elements in computer memory, wherein the inventory item attributes describe an inventory item, the inventory item has an RFID identification tag having an RFID identification tag code, and the inventory item attributes typically include an RFID identification tag code field, a control value, an acceptable control value range, and an out of range action. Some exemplary embodiments include detecting changes in the inventory item attributes, wherein detecting changes in inventory item attributes includes reading, through an RFID reader, the RFID identification code from the RFID tag associated with the inventory item, recording detected changes in inventory item attributes, comparing the control value and the acceptable control value range, and taking action in dependence upon the result of the comparing and the out of range action. In exemplary embodiments, the steps of detecting changes, recording detected changes, comparing the control value and the acceptable control value range, and taking action are typically carried out through Java servlets in at least one OSGI-compliant service bundle installed and operating in an OSGI-compliant service gateway.

Detail Description Paragraph:
[0030] The term "network" is used in this specification to mean any networked coupling for data communications. Examples of networks useful with the invention include intranets, extranets, internets, local area networks, wide area networks, and other network arrangements as will occur to those of skill in the art. The use of any networked coupling among service gateways, RFID readers, local interactions databases, and remote interactions databases coupled through designated network addresses is well within the scope of the present invention.

Detail Description Paragraph:
[0031] "Network address" means any network address useful to locate an RFID reader, a service gateway, a local interactions database, or a remote interactions database on any network. Network addresses include any internet protocol address useful to locate a service gateway, an RFID reader, or a remote interactions database on an internet. Network addresses useful with various embodiments of the invention include local internet protocol addresses, private internet protocol addresses, and temporary Internet addresses assigned to a Web client by a DHCP server, and permanent, official registered Internet addresses associated with domain names.

Detail Description Paragraph:
[0036] Turning now to FIG. 1, a first embodiment of the invention is shown as a system for inventory control for inventory items having RFID tags. "RFID" means Radio Frequency Identification, a technology for identifying objects by use of an antenna, a transceiver, and a transponder. RFID transceivers, in this specification, are referred to as "RFID readers." As

the term `transceiver` implies, however, RFID readers both read and write information to and from RFID transponders. RFID transponders are referred to in this specification as "RFID tags." RFID tags are programmed with RFID identification codes unique to each RFID tag. In addition, RFID tags are programmed in some embodiments with other information in addition to RFID identification codes, such as, for example, inventory item type codes, location codes, inventory dates, control values, and so on.

Detail Description Paragraph:
[0037] In typical embodiments, an RFID antenna (112) emits radio signals (118) to activate an RFID tag (114) and read and write data to and from the tag. Antennas act as data conduits, part of a coupling for data communications, between tags and transceivers or RFID readers. Antennas are available in a variety of shapes and sizes. Antennas in some embodiments are built into door frames to receive tag data from objects passing through doors or mounted on interstate toll booths to monitor traffic passing by on a freeway. In some embodiments, where multiple tags are expected continually, the electromagnetic field produced by an antenna is constantly present. If constant interrogation is not required, the electromagnetic field in many embodiments is activated by sensors.

Detail Description Paragraph:
[0038] Often an antenna (112) is packaged with an RFID reader (110), which is configured in various embodiments as a handheld or as a fixed-mount device. An RFID reader (110) in typical embodiments emits radio waves in ranges of anywhere from one inch to 100 feet or more, depending upon its power output and the radio frequency used. When an RFID tag (114) passes through the electromagnetic field of a radio signal from an RFID antenna, the RFID tag detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit (silicon chip) and the data is passed to a service gateway (106) for processing.

Detail Description Paragraph:
[0042] RFID tags come in a wide variety of shapes and sizes. Animal tracking tags, inserted beneath the skin, can be as small as a pencil lead in diameter and one-half inch in length. Some tags are screw-shaped to identify trees or wooden items, or credit-card shaped for use in access applications. The anti-theft hard plastic tags attached to merchandise in stores are RFID tags. In addition, heavy-duty 5- by 4- by 2-inch rectangular transponders used to track intermodal containers or heavy machinery, trucks, and railroad cars for maintenance and tracking applications are RFID tags.

Detail Description Paragraph:
[0043] RFID tags are categorized as either active or passive. Active RFID tags are powered by an internal battery and are typically read/write, i.e., tag data can be rewritten and/or modified. An active tag's memory size varies according to application requirements; some systems operate with up to 1 MB of memory. In a typical read/write RFID work-in-process system, a tag might give a machine a set of instructions, and the machine would then report its performance to the tag. This encoded data would then become part of the tagged part's history. The battery-supplied power of an active tag generally gives it a longer read range. The trade off is greater size, greater cost, and a limited operational life (which may yield a maximum of 10 years, depending upon operating temperatures and battery type).

Detail Description Paragraph:
[0044] Passive RFID tags operate without a separate external power source and obtain operating power generated from the RFID reader. Passive tags are consequently much lighter than active tags, less expensive, and offer a very long operational lifetime. The trade off is that passive RFID tags have shorter read ranges than active tags and require a higher-powered reader. Some passive are programmed with a unique set of data (usually 32 to 128 bits) that cannot be modified. Read-only tags most often operate as a license plate or index into a database, in the same way as linear barcodes reference a database containing modifiable product-specific information.

Detail Description Paragraph:
[0045] The inventory items (116) of FIG. 1 are said to "have" RFID tags, by which is meant a close physical proximity. The RFID tags may or may not be physically attached to the inventory items, as, for example, the case of drugs in which pills are stored in a pill container where the container rather than the pills has the RFID tag affixed, although the pills are considered the inventory items of interest.

Detail Description Paragraph:
[0046] In the method aspects of the present invention, steps of methods are typically carried out by use of Java servlets (109) in OSGI-compliant service bundles (108). Service gateways (106) often download service bundles (108) remotely across WANs (104), such as, for example, the Internet, from remote services databases (101), thus reducing the memory overheads for the service gateways, which as mentioned above, are typically small footprint, low overhead installations.

Detail Description Paragraph:
[0048] Typical embodiments of the present invention include equipment useful in inventory control, including for example scales (406), clocks (507), and thermometers (508). In typical embodiments, data communications with inventory control equipment is carried out through Java servlets (109) in service bundles (108) in a service gateway (106). Such data communications in some embodiments is directly coupled; in other embodiments, as shown in FIG. 1, the data communications is carried out through a LAN (104). The LAN in some embodiments is wireless, including for example, wireless LANs effected by use of 802.11b connections or Bluetooth piconets. Such networked (104) couplings for data communications are also used in many embodiments between service gateways (106) and RFID readers (110).

Detail Description Paragraph:
[0052] Typically, the inventory item attributes include an RFID identification tag code field (306), a control value (308), an acceptable control value range (312), and an out of range action (314). Typical embodiments also include detecting changes (206) in the inventory item attributes, wherein detecting changes in inventory item attributes includes reading (208), through an RFID reader (110), the RFID identification code (210) from the RFID tag associated with the inventory item (117), and recording (222) detected changes in inventory item attributes.

Detail Description Paragraph:
[0053] Typical embodiments further include comparing (226) the control value (308) and the acceptable control value range (312), and taking action (216) in dependence upon the result of the comparing and the out of range action (314). In some embodiments, the steps of detecting changes (206), recording detected changes (222), comparing (226) the control value and the acceptable control value range, and taking action (216) are carried out through Java servlets (reference 109 on FIG. 1) in at least one OSGI-compliant service bundle (108) installed and operating in an OSGI-compliant service gateway (106).

CLAIMS:

1. A method of inventory control comprising the steps of: providing inventory item attributes comprising data elements in computer memory, wherein the inventory item attributes describe an inventory item, the inventory item has an RFID identification tag having an RFID identification tag code, and the inventory item attributes comprise: an RFID identification tag code field, a control value, an acceptable control value range, and an out of range action; detecting changes in the inventory item attributes, wherein detecting changes in inventory item attributes includes reading, through an RFID reader, the RFID identification code from the RFID tag associated with the inventory item; recording detected changes in inventory item attributes; comparing the control value and the acceptable control value range; and taking action in dependence upon the result of the comparing and the out of range action.

2. The method of claim 1 wherein the steps of detecting changes, recording detected changes, comparing the control value and the acceptable control value range, and taking action are carried out through Java servlets in at least one OSGI-compliant service bundle installed and operating in an OSGI-compliant service gateway.

11. A system of inventory control comprising: means for providing inventory item attributes comprising data elements in computer memory, wherein the inventory item attributes describe an inventory item, the inventory item has an RFID identification tag having an RFID identification tag code, and the inventory item attributes comprise: an RFID identification tag code field, a control value, an acceptable control value range, and an out of range action; means for detecting changes in the inventory item attributes, wherein means for detecting changes in inventory item attributes include means for reading, through an RFID reader, the RFID

identification code from the RFID tag associated with the inventory item; means for recording detected changes in inventory item attributes; means for comparing the control value and the acceptable control value range; and means for taking action in dependence upon the result of the comparing and the out of range action.

12. The system of claim 11 wherein the means for detecting changes, means for recording detected changes, means for comparing the control value and the acceptable control value range, and means for taking action are carried out through Java servlets in at least one OSGI-compliant service bundle installed and operating in an OSGI-compliant service gateway.

21. A computer program product of inventory control comprising: a recording medium; means, recorded on the recording medium, for providing inventory item attributes comprising data elements in computer memory, wherein the inventory item attributes describe an inventory item, the inventory item has an RFID identification tag having an RFID identification tag code, and the inventory item attributes comprise: an RFID identification tag code field, a control value, an acceptable control value range, and an out of range action; means, recorded on the recording medium, for detecting changes in the inventory item attributes, wherein means, recorded on the recording medium, for detecting changes in inventory item attributes include means for reading, through an RFID reader, the RFID identification code from the RFID tag associated with the inventory item; means, recorded on the recording medium, for recording detected changes in inventory item attributes; means, recorded on the recording medium, for comparing the control value and the acceptable control value range; and means, recorded on the recording medium, for taking action in dependence upon the result of the comparing and the out of range action.

22. The computer program product of claim 21 wherein the means for detecting changes, means for recording detected changes, means for comparing the control value and the acceptable control value range, and means for taking action are carried out through Java servlets in at least one OSGI-compliant service bundle installed and operating in an OSGI-compliant service gateway.

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L10: Entry 1 of 4 File: USPT Jul 6, 2004

DOCUMENT-IDENTIFIER: US 6758397 B2
TITLE: Machine readable label reader system for articles with changeable status

Abstract Text (1):
A method and system for tracking a changeable description of an article labeled by a machine-readable label (MRL) allows articles like fresh vegetables to be labeled with MRL devices. A unique code in the MRL is correlated with descriptive information about the article including, possibly, changeable information such as a remaining quantity of the article. The descriptive information can be updated, so for example, if the information relates to a bottle of vinegar, the quantity remaining is always correlated to the MRL if the information is regularly updated. Thus, for example, a household inventory can be maintained with quantities that are below an initial value of a purchased item. Also, fresh foods like vegetables and deli foods can be automatically tracked by a home inventory system that reads MRL devices such as radio frequency identification tags.

Brief Summary Text (3):
The invention relates to systems that employ machine-readable labels to store data and deliver them to readers when scanned. Examples include one- and two-dimensional bar-codes, memory buttons, smart cards, radio-frequency identifier (RFID) tags, smart cards, magnetic stripes, micro-chip transponders, etc.

Brief Summary Text (5):
Various devices for encoding data currently exist and are under development. These take many different forms, from optical devices such as two-dimensional bar-codes to radio devices such as transponders. These devices generally permit objects to be tagged or labeled to permit machines to read data associated with the object. One-dimensional bar-codes have been used widely for this purpose, but they are limited in terms of how much information they can store. For example, they can identify classes of objects, but not individual objects.

Brief Summary Text (6):
A recent entrant to this field, radio-frequency identifier (RFID) tags, delivers information by radio signals to a reader just as a transponder does. One of the attractions of RFID devices is their potential to carry a large quantity of information. This is in contrast to conventional bar codes whose data capacity is much more limited. Another alternative to conventional bar-codes are two-dimensional bar codes. These are two-dimensional symbols that are capable of encoding much more data than a conventional bar-code. Another encoding device is the iButton.RTM., a small token that stores information that can be read by a reader that makes electrical contact with the iButton.RTM.. Still other devices for storing information include printed and non-printed (e.g., etched) machine readable symbols (e.g., using a pattern recognition process) and digital watermarks.

Brief Summary Text (7):
Commercial applications of RFID technology are expected to be highly successful. Supply chain management is one of the biggest. Plans are for manufacturers to register each product's serial number in a database that could be accessed during the product's journey through the supply chain. By keeping the data on a network resource such as a server, a service provider could enable stores or warehouses to use a portable scanner to check the history of the product. Retailers thus could check for authenticity or theft, as well as monitor out-of-stock and out-of-demand trends. RFID tags may be programmable and may also include sensors that can record, right in the tag, various environmental factors such as the amount of time a crate of fruit was held at a given temperature.

Brief Summary Text (8):

An obvious model for a future consumer market for RFID tags is the present consumer market for bar-code readers. While bar-code readers have been widely adopted by commercial and industrial users, so far, attempts by manufacturers and vendors to develop consumer markets have met with very limited success. Some examples of consumer applications, current and future, are discussed below.

Brief Summary Text (9):
One example of a bar-code reader product aimed at consumers is the Cue Cat.RTM., a reader designed to be installed on a computer and used to read bar-codes printed in catalogues, magazine advertisements, and product labels. When a user scans a bar-code, the code is automatically conveyed through the Internet to a server that points the user's browser to a web site for that particular bar-code. The user is saved the trouble of typing in a web address, which could conceivably be a long one if every product had its own web address, but the benefit is not much greater than that. Also, web addresses can be generated for existing products (like a year-old can of peaches in the cupboard) without the user having to look one up (such as by searching with a search engine). If the maintainer of the Cue Cat.RTM. service fails to provide a link for a product, users can suggest a web address. Another similar proposed application is bar-codes on coupons that take the user to a `bonus coupon` section on a web site.

Brief Summary Text (10):
Another proposed application is recipe books with bar-codes that a user can scan and automatically generate a shopping list for the grocery store. The user chooses what to purchase by scanning bar-codes on labels of products at home. From this, a service generates a shopping list to take to the store and use as a dietary guide. Using a cordless barcode scanner the user scans barcodes on boxes or wrappers of grocery items to add them to the user's shopping list. The scanner is synched to a computer before shopping, and by means of an Internet connection, the personalized shopping list is generated and printed out. The shopping list includes healthy suggestions for the items on the list that are identified as similar to what was originally scanned, but more consistent with the user's specified dietary goals. Categories such as less fat, less sodium, fewer calories or other options are provided for. The list is broken down into two columns, one containing suggested choices and one with the items originally scanned. An explanation of why this food item is better is provided for each item. An indication is also provided for how close the original item is to the system's best choice for the class of product. A recipe icon next to some items cues the user to click on links for recipes that use the items on the shopping list and conform to the nutritional profile. For grocers that subscribe to a service, coupon offers can be entered on the shopping list and even downloaded to the user's shopper's loyalty card file.

Brief Summary Text (11):
Portable readers are used, or proposed to be used, in various other applications. For example, a consumer can maintain an inventory of bar-coded valuables, such as bicycles, camcorders, cars, etc. Another application allows users to scan items at participating retailers and build a "wish list" that they can post to a personalized web page. The list can be organized and emailed to others for gift-related occasions. Shoppers register at a mall kiosk, set up a password, and check out a scanner. Shoppers then build their "wish list" by simply scanning bar codes of items. The data is then downloaded to the kiosk when the scanner is returned and the wish list is posted to the web site. Yet another application, which is very similar to the Cue Cat.RTM. is the idea of placing a bar-code on a movie or sporting event ticket stub. The bar-code, in Cue Cat.RTM.-fashion, brings the user to a web-site automatically, allowing the user to purchase products relating to the event, such as sports memorabilia or movie sound-tracks. Yet another, offered by AirClic.RTM., uses bar-codes attached to print articles to bring the user to a web site giving access to updated information, purchase opportunities, or other web features relating to the article. The technology is envisioned as being incorporated in handy appliances such as a cell phone, so the user does not need to be near a computer to use it.

Brief Summary Text (12):
The above examples illustrate various attempts to find consumer applications for their products. Most of these are one-off (specialized) ideas and confer little benefit over traditional ways of accomplishing their respective tasks. The wish list application is highly specialized, as are the grocery shopping list application and the home inventory application. With bar-codes being as pervasive as they are, it is surprising that nobody has come up with truly useful ways of using them, at least for consumers. As discussed above, one component of a break-through may be to increase the amount of data that can be stored on bar-code or other

types of data storage vehicle. While this, by itself, will not make "killer applications" roll off the tops of designers' heads, many benefits arise in connection with the increased data capacity of RFID tags and other technologies for storing larger quantities of data than traditional bar-codes.

Brief Summary Text (13):
Unlike bar-codes, which can encode only enough data to correlate a small amount of information, some machine-readable label (MRL) devices can store enough information to accomplish some very interesting things. For example, if attached to a product, it can uniquely identify that particular product, which could be tied in a central database to its date of manufacture, the shipment vessel it was conveyed in, its date of shipment, the retailer to whom it was shipped, to whom it was sold, how it was manufactured, when, etc. Also, some MRL devices can also be programmed to change the data stored in them, as, for example, does the temperature sensing supply chain application mentioned above. Another advantage is that some are capable of being scanned by holding a reader some distance away and without precisely aiming the reader with respect to the MRL device. Some readers are capable or reading many MRL devices at once, for example RIFD readers.

Brief Summary Text (15):
Research projects, such as at Massachusetts Institute of Technology (MIT) Media Lab, have explored using RFID tags to automate many activities. For example, one project resulted in the construction of a coffee machine that could read the identity of the owner of a coffee mug placed for receiving coffee. Using this information, the machine made the particular type of coffee favored by the mug's owner and played music preferred by him/her. Another application proposed by the Media Lab is a refrigerator which reads the RFID tags of its contents, thereby maintaining an inventory. Another example was a microwave oven that gave instructions to the user and programmed itself for the type of food (given by an RFID tag) that was to be cooked. These systems are envisioned as being part of a household network with all manner of input and output devices, all of them intelligent and environment-responsive. The refrigerator knows what the oven is doing. Ovens, sinks, etc., all know their contents, status, and are enabled to act on objects both physically and digitally. The cupboards can advise a user as to whether s/he has all the ingredients you need to make a recipe. The kitchen observes the user making the recipe and gives advice synchronized with the user's activity.

Brief Summary Text (16):
A white paper written by Joseph Kaye of MIT Media Lab proffered a number of concepts relevant to the environment of the current invention. One concept is for everything to be connected. For example, the RFID tag on a Tupperware container informs a reader in the sink that the container is being washed and is therefore empty. The food that had been stored in the container was removed and the container emptied. A particular food had previously been associated with the container's RFID tag by the refrigerator which "asked," when the container was put into the refrigerator, for information on the container's contents. The contents were thereafter part of the food inventory until the container was emptied. A smart kitchen envisioned by MIT Media Lab helps a user cook by guiding the user through a recipe, recommending substitutions, and telling the user where to find ingredients. Mr. Kaye also suggests identifying all products uniquely and providing each with an individual web page, available from which is every detail of that particular product's history.

Brief Summary Text (17):
There is a need in the current state of the art for applications of code-reading devices which provide real benefits that consumers will want and to provide these benefits with a minimum of hassle so consumers will adopt the applications.

Brief Summary Text (19):
The invention is designed for an environment in which inexpensive machine-readable label devices ("MRL devices") appear in a great variety of contexts, as do bar-codes presently. In the future, high data-density MRL devices may appear on purchasable products, ticket stubs, advertising media, shipping containers, delicatessen containers, etc. Readers of MRL devices may also proliferate. For example, they may be found in portable devices such as personal information managers (PIMs), cell phones, or cross-over devices. They may also be found incorporated in many common fixed appliances such as cash registers, publicly-accessible kiosks, domestic appliances, TV remote controls, etc.

Brief Summary Text (25):
With a robust and flexible strategy in place for leveraging all available user state information, it is easier for new functionality to be added. For one thing, a service provider who creates a resource database does not need to script a response for each anticipated situation. This makes the task of adding new responses to a response database less onerous. For another thing, a single situation may admit of a variety of different responses. The usual way of handling that is to give the user a choice. By using the robust strategy suggested here, the system can filter the multiple of potentially applicable responses, avoiding the need for the user to make the choice in subsequent steps. The user receives the desired response faster and with less hassle. Readers affixed to a particular object, such as a home appliance, may transmit information identifying the particular object to the information resource. For example, the microwave oven may identify its make and model number to the information resource before receiving programming instructions. By providing the information resource with specific details about the context of the request for information (e.g., "I am a microwave oven, located in a residence, and I am requesting information about this particular frozen dinner."), the information resource can make its response as relevant as possible ("You must want programming instructions.") Without the particulars of the context, it might take several exchanges between a user and the information resource before the relevant information was delivered. For example, the user could be shopping and simply want to know something about the product in anticipation of purchasing it. Without the context, the situation is much like visiting a worldwide web (WWW) site today, where it is necessary to navigate a menu tree before the desired information can be found.

Brief Summary Text (29):
While it has been proposed that MRL devices and bar-codes be used to connect users to web sites for purchase of goods, this degree of automation merely avoids the need for the user to enter a web address. This idea is basically the same as the Cue Cat.RTM. system. Since machine-readable symbols like MRL devices can bring users to a web site quickly, they have the potential to facilitate impulse-purchasing. There is a much greater likelihood of a sale when a user is provided an opportunity to buy a movie soundtrack just as the user leaves the movie with the music still fresh in his/her mind. This could be done by placing an Internet terminal in a self-service kiosk at the theater. The smaller the number of steps involved, the more likely a sale will be completed. In an embodiment of the invention, a MRL device is attached to a ticket stub. The device may contain an address at which the movie soundtrack can be purchased. Moreover, the device contains sufficient data density to correlate or store account, authorization, shipping, and authentication information to allow the purchase to be completed without any prompting from the user aside from the selection and confirmation of an item to be purchased. If a theatergoer purchases tickets using a credit card, the account can be linked temporarily to data on the MRL device on the ticket stub. This data can further link an order process to preference information contained in user-profile database and the purchase used to augment that database. To protect the user's account, the connection between the user's credit account and the ticket data may be given a predefined expiration period, say 2 hours after the movie or other event is over. As an inducement for the user to purchase at the theater, the user can be given a discount incentive such as lower price on his/her next ticket purchase, discounted price for the goods ordered, or a free gift. Precisely the same functionality can be provided through a portable terminal rather than a kiosk terminal or a home computer connected to the network; or even a portable computer or terminal.

Drawing Description Text (14):
FIG. 12 is a flow diagram of a process for initiating a delayed interaction with a server according to an embodiment of the invention.

Drawing Description Text (15):
FIG. 13 is a sequence diagram illustrating an example interaction between a server and a scanner terminal in which the scanner and server complete a transaction including transfer of information to the terminal.

Drawing Description Text (16):
FIG. 14 is a sequence diagram illustrating an example interaction between a server and a scanner terminal in which the scanner and server do not complete the transaction but delay the transfer of information to the terminal to a later time.

Drawing Description Text (17):

FIG. 15 is a sequence diagram illustrating an example interaction between a server and a scanner terminal in which the scanner and server complete a transaction including transfer of information to the terminal at time after the scanning took place.

Drawing Description Text (18):
FIG. 16 is a sequence diagram illustrating an example interaction between a server and a scanner terminal in which the scanner and server complete a transaction including transfer of information where the information is routed in a manner other than directly to the terminal.

Detailed Description Text (2):
Referring to FIG. 1, a MRL device T is prompted by, and transmits data to, a portable reader 100 or a fixed terminal 120 with an integrated reading device. Note that the reader 100 may be integrated into another appliance, such as a personal digital assistant (PDA) or cell phone or other. In an embodiment, the MRL device T is a radio transponder that generates RF links 110 with readers 100/120. The RF links 110 may be momentary according to known transponder technology. Alternatively, the links 110 may represent data transfer corresponding to any high data density transmission method including scanning of printed symbols such as two-dimensional bar-codes, contact reading of a memory token such as an iButton.RTM. or smart cards, or reading of a magnetic stripe on a surface. The particular medium is independent of some aspects of the invention.

Detailed Description Text (4):
The smart appliances 170-185 are all network-enabled, meaning they each have a microprocessor and at least an input or output device to communicate with a user. For example, the table saw 185 may be enabled to receive software from the Internet to permit it to implement a safety feature or the microwave oven 180 may have a terminal, including a display and keyboard, for displaying recipes taken from the Internet. Smart appliances are discussed widely in the published literature and are not discussed in further detail herein. Each of the smart appliances 170-185 may be equipped with a fixed reader (not shown separately) capable of reading the MRL device T. Data may also be transferred from the portable reader 100 to a device such as the computer 190 by a temporary wired or wireless connection 195 as used for synchronizing data on personal digital assistants and notebook computers. When the reader of a smart appliance 170-185 or home computer 190 reads a MRL device T, it may interact with the user responsively to data in the device and to various data stored on the LAN server 150, the computer 190, or on the network server 140.

Detailed Description Text (8):
Referring to FIGS. 1 and 6A, a process that may be implemented based on the hardware environment of FIG. 1 allows a user to receive targeted promotional information through a fixed terminal 120 or portable reader 100 while shopping, for example. Assume the user chances upon a display, advertisement, or purchasable product and is interested in purchasing or learning more about it. For example, the object could be a movie billboard and the user wishes to determine where and when the movie may be seen or to read a review. For the other example, the object may be a food product and the user wishes to know further nutritional information about it or how it can be prepared for eating. The user scans the MRL device T causing the reader 100/120 to acquire data from the MRL device T in step S1.

Detailed Description Text (9):
In step S2, an interaction may be initiated between the reader 100/120 and the LAN server 150 or Network server 140 beginning with the transmission of data to the network server 140. For example, the data transmitted may include data from the MRL device T plus other information, the other information including, for example, the identity of the user and/or certain profile data characterizing the user. Included with the information from the MRL device T may be a network address to which the reader 100/120 may connect to complete the information exchange. The interaction is continued as defined by an interaction process running on the server 140 at step S3. The data exchanged in the interaction may include data responsive to the acquired data, further user input S4, and/or data stored on the network server 140. Generally, it is contemplated that the interaction would be conducted in accord with, and by means of, a client-server process, for example using HDML (handheld device markup language), a markup language for small wireless devices or HTML (hypertext markup language).

Detailed Description Text (11):
To give an example of an exchange, imagine that a shopper scans a pair of tennis shoes at a

department store. The user's reader 100 acquires a unique identifier from the MRL device T, a unique identifier indicating the owner of the reader 100, and an address corresponding to the network server 140. The reader 100 then transmits these data to the network server 140. The network server 140 runs an interaction process that receives these data and identifies a subprocess that corresponds to the received data. For example, the network server 140 might be owned by the manufacturer of the tennis shoes. The interaction process may look up information about the particular pair of tennis shoes whose MRL device T the user scanned, the date of manufacture, the style, the store to which it was shipped, and so on. The interaction process may also acquire personal profile information about the user from its own internal database or a subscription to a third party database stored on a further network server 140. The personal profile information may contain such data as the style (contemporary or traditional), amenability to participant sports and type of sports, color preferences, etc. Included among the information about the particular pair of shoes may be, for example, that they came from a lot that has been recalled. The interaction process may also retrieve information indicating that the quality of the shoes is not consistent with previous purchase patterns of the user. The interaction process may also retrieve information indicating that the user plays other sports than tennis. In response to all this data, the interaction process may be defined such as to generate an up-selling recommendation by suggesting a higher quality type of shoe. Further the interaction process may be such as to generate a cross-selling promotion indicating to the user that the particular store to which the shoes were shipped is having a sale on tennis racquets (the reasoning behind the programming of the interaction process being the conclusion that the user is new to tennis and may need the equipment).

Detailed Description Text (12):
The interaction process may be a very simple one, consisting of the generation of a single message promoting a product, for example. Alternatively, the interaction process may request feedback from the user as in step S4. For example, it may provide a menu with a number of options that may be generated on the display of the reader 100/120. For convenience, the user may be given the option, outright or in the course of the dialog process, of marking certain information, or even the entire interaction process, for later review and completion. Alternatively, the user may be given the option of receiving the data by email or having it stored locally on the reader 100/120 for later review and interaction in the way one currently may save an HTML file locally and interact with links within it when connected. After the reader accepts input in step S4, it may continue an interaction iteratively until completed depending on the incidence of scan events in a status monitoring loop at S5.

Detailed Description Text (13):
Referring now to FIG. 6B, at the server side, the interaction begins at step S55 with the receipt of data from the reader 100/120. The appropriate dialog process is selected at step S60 and begins at step S65 accordingly. The data received at step S55 may include directives from the user such as a preference that any selling information be sent to him/her by email or simply discarded.

Detailed Description Text (14):
Inputs may be matched to responses using various information retrieval techniques used for matching search templates to information resources such as documents or interaction processes. The area of information retrieval is a vast and fast-growing technical area, a detailed discussion of which is outside the scope of the present specification, except as indicated herein. Note that the term "resource retrieval" might be more apt to describe the invention because the response desired may not simply be a static piece of information, but a process, such as an interaction with the user or a control function such as used for programming a microwave oven. The WWW currently provides ample examples of processes that are retrievable by searches, such as equipment control, transaction, monitoring, etc., so this point need not be elaborated upon.

Detailed Description Text (15):
In prior art bar-code readers and RFID tag reader technology, the process of matching responses stored in a resource space to the context of a scan event focuses either on the article to which the bar-code or RFID tag is affixed or the device to which the reader is connected. In other words, none displays an ability of one reader to perform multiple tasks based on the combination of variables, at least including the type of reader and the type of article identified by a MRL device. This ability may be called "context versatility." Here is a representative list of examples of prior art concepts. Most of these call up a resource, such

as a web site, and then require the reader to navigate a menu tree to get to the desired result.

Detailed Description Text (16):
Portable bar-code reader used to order a product, get directions to a store, make reservations, by scanning a bar-code in a magazine, newspaper, brochure, or other printed advertisement.

Detailed Description Text (17):
Scanning bar-codes in a catalog to fill an online "shopping cart."

Detailed Description Text (18):
Scan a bar-code and have further information routed to you by email.

Detailed Description Text (19):
Order film soundtrack, sports memorabilia, etc. from a bar-code printed on ticket stub.

Detailed Description Text (22):
The above examples are all entirely dependent on the bar-code scanned and the data entered (e.g., a menu) by a user. This simply corresponds to the automatic linking of a terminal to a particular web site. The next items do provide context-responsiveness in a sense, since in each one, a particular response is generated by a particular reader. But these are blue-sky proposals or research projects and the papers on the subjects provide scant information on how the results would be achieved or context-versatility.

Detailed Description Text (23):
Scan an RFID tag on a frozen dinner with a microwave oven reader to program the microwave oven for that particular frozen dinner.

Detailed Description Text (25):
Determine the contents of cabinets in a kitchen by scanning RFID tags of items, such as pots, etc.

Detailed Description Text (26):
Place a coffee cup in a coffee maker and the coffee maker plays music and makes the particular kind of coffee preferred by the user designated by a RFID tag built into the cup.

Detailed Description Text (30):
The prior art information retrieval processes are niche processes designed for a particular MRL device or bar-code and type of reader. However, such rare events could comprise a large proportion of scan events, if intelligent responses were generated by the system. For example, suppose the user in the previous example wished to build a shelf unit that could support boxes of cereal? Or supposed the user was eating cereal as a snack while working in his/her tool shop? In the former case, there is intelligence in the cereal box that could be used to tailor a response, that is, that the cereal box has certain dimensions. In the latter case, there is intelligence in the type of reader, for example the indication that the user is likely in a tool shop as opposed to somewhere else. This hidden intelligence could be used to select a relevant response. In the first case, the table saw manufacturer might have sufficient demand for plans for shelving units for it to make sense to provide a number of plans. Also, a cereal manufacturer would probably have information about cereal (or other products that could be cross-sold) that is particularly relevant to users who like to eat cereal as a snack.

Detailed Description Text (34):
The search engine 603 searches the Internet 601. For example, the search engine 603 could incorporate a search engine such as Google.RTM.. The query used for searching is, preferably, generated from the contents of the MRL device T either directly or indirectly. For example, if the MRL device contains only a serial number, it may be necessary for some process (not illustrated) to look it up on a remote server, or perhaps a database in the reader 609, to determine what the MRL device is connected with. Alternatively, the MRL device may store one or more characterizations of the article to which it is connected. For example, it could contain the label "sweet breakfast cereal," and/or "Cap'n Crunch.RTM.." Once the nature of the article identified in the MRL device is determined, it can be incorporated in a search query by the search engine 603. A characterization of the reader may be done in the same way. The reader may be programmed to provide a unique identifier code as well as a characterization (or multiple

alternative characterizations) of itself for purposes of formulating a query for an Internet search engine. The characterization of the reader may also be incorporated in the query. The same may be done with any profile data. For example, the query could contain a particular set of profile data that is specifically set aside for Internet searches. Alternatively, the profile data may be left out for the Internet search by the search engine 603. The query may employ a template, or set of templates for alternate queries, with slots for the characterization of the reader and slots for the characterization of the labeled article. For example "Use [reader] with [article]" or simply "[reader] AND [article]." The results retrieved by the search engine 603 may then be sent to the formatter 613 and arranged into an output to the reader 609 via a user interface (UI) built into it.

Detailed Description Text (35):
Note, the term "resource base" is used here to identify any kind of data space that is computer-addressable including the World Wide Web, databases, servers such as news feeds, media feeds, with connections via packet and switched services such as the Internet and regular telephone and cellular phone services. Resources in the resource base may be data or process objects so that the resources found in searching the resource space may result in the initiation of a process, such as the automatic control of a remote system, the automatic initiation or completion of a transaction such as a bank deposit, or the initiation of a dialog with a user using the reader 609. The resource base may be made and maintained by any entity and can be a conduit, such as a web content aggregator, that combines resources from several sources.

Detailed Description Text (39):
An example of a dictionary that relates terms to other terms along a variety of different dimensions is WordNet, a lexical dictionary used in the field of computational linguistics. WordNet relates words to other words that are related to a subject word along various dimensions. It provides hypernyms, antonyms, meronyms (meronym is a word that names a part of a given word), holonyms (holonym is a word that names the whole of which a given word is a part), attributes, entailments, causes, and other types of related words. Such a dictionary could be used to create alternative queries that would have a much higher likelihood of producing useful results under certain circumstances, such as the table saw/cereal box example. Thus, a dictionary that provides terms naming a place where a reader is likely located might be used. So, for example, the search process might correlate table saw with basement or workshop as the place where the table saw would normally be located. Since the terms can, in many instances, be identified with an object very specifically, for example, the precise box of cereal including its date of manufacture, the type of paper its packaging is made of, and the expiration date stamped on the package, the related information can be very precise. Thus, a "dictionary" may be created to provide a set of additional terms that are related in various ways to terms generated directly from the context. For example, the relationships can be such as:

Detailed Description Text (40):
1. how a named object is used,

Detailed Description Text (41):
2. where a named object is used,

Detailed Description Text (42):
3. when a named object is used,

Detailed Description Text (44):
5. physical dimensions of an identified object,

Detailed Description Text (45):
6. other characteristics of the named object, etc.

Detailed Description Text (47):
The purpose of the dictionary 607 is to multiply the kinds of information available in a query based upon nouns characterizing the article to which the MRL device is attached, the reader, terms defining preferences, and any other data. As mentioned previously, however, a variety of different kinds of information can be provided at the outset, without requiring a separate dictionary. For example, the MRL device T could point to a particular article by means of a data resource, say a database maintained by the manufacturer of an article to which the MRL

device was attached. That database may contain a set of alternate terms that serve to identify the object, the places it is normally used, ways it may be used, its physical dimensions, etc. The MRL device T could contain these alternate terms at the outset. But such an arrangement presupposes that the entity that provides information about the article has chosen to provide all the information that could be relevant about the article. Also, preparing and maintaining the currency of this kind of data can be onerous unless there is a significant incentive for the entity with access to the data. In some cases this is virtually impossible (for example, the location of a portable reader at the time of the scan) and in practice, it is likely to be very difficult simply because (e.g., the delicatessen that prepared the potato salad) not all parties involved will have the resources to provide all the information required. The alternative is for the system to have a generic dictionary that it can use to expand any terms, and filter the results based on the quality of the matches obtained.

Detailed Description Text (51):
The above example of a cement truck and a case of Coke.RTM. may seem far-fetched, but one of the goals of the inventive system is to provide value in rare circumstances for which it might otherwise be too expensive to create links to particular resources. As discussed, such rare circumstances may account for a significant percentage of the opportunities for using the system. There is a synergistic benefit to providing meaningful responses to unusual requests. It means that users can anticipate that the system is useful most of the time, even when the circumstances are not paradigmatic. The more often the system can be used, the more likely the user will turn to it when more common circumstances permit. It may also prove to be fun for a user to discover some unimagined connection between where s/he is currently, what s/he is doing and some object identified by a MRL device. This can create powerful marketing opportunities.

Detailed Description Text (56):
The invention and prior art search techniques can identify a particular resource and invariably generate an indication of goodness of fit, i.e., a measure of how appropriate each response is to the given set of input data. The response(s) is (are) then selected based on which produced the best fit to the input data. Assume the input data includes a noun characterizing the type of reader (e.g., "microwave oven" or "cement truck") and a noun characterizing the object to which the MRL device is associated (e.g., "frozen dinner" or "can of motor oil"). For a simple illustrative example, the information provider's server might have, say, three responses, (1) one for programming a microwave oven for a frozen dinner, (2) one giving instructions on how to add motor oil to a cement truck, and (3) one giving navigating instructions on where to buy frozen dinners. Each response has a corresponding template indicating an input vector that matches each response. In this example, template for response (1) might be [reader=microwave oven, MRL device=frozen dinner]; the template for response (2), [reader=cement truck, HDRM device=can of motor oil], and the template for response (3), [reader=car or portable reader, MRL device=frozen dinner]. The template's factors may also be weighted (in Bayesian network fashion). An input vector matching any of these templates perfectly would cause the information provider server to generate a very high goodness of fit ("confidence") indication for one of the responses and a low one for the others. A template matching only one component of the input vector would produce a lower rating. If no other match competed with this lower rating, then the corresponding response might be generated by the server. The latter situation would result in multiple good fits and might require a request for further information to make the correct choice clearer.

Detailed Description Text (59):
In FIG. 10, a configuration that uses a dictionary on the resource side of the system is illustrated. A MRL device 400 is read by a reader 405. The reader 405 applies relevant characterization terms resulting therefrom to a dictionary process 410. The dictionary process 410 generates alternate terms as discussed above and applies these to a resource search engine process 425. The resource search engine process may optionally receive general data 415 and profile data 430, such as preferences and characteristics relating to the user. The resource search engine process 425 then generates a set of alternative search queries with which it searches an index 435. The index is generally regarded as a data_object part of the search engine process, but here it is illustrated separately to facilitate discussion of the embodiment.

Detailed Description Text (64):
Preference data store 237, (as well as profile 430, FIG. 8, preference database 611, FIG. 7, and similar components in other figures) may contain data obtained by various means. A first

type of device for building a preference database is a passive one from the standpoint of the user. The user merely makes choices (e.g., menu choice in a browser built into a reader) in the normal fashion and the system gradually builds a personal preference database by extracting a model of the user's behavior from the choices. It then uses the model to make predictions about what the user would prefer to watch in the future or draws inferences to classify the user (e.g., a baseball enthusiast or an opera lover). This extraction process can follow simple algorithms, such as identifying apparent favorites by detecting repeated requests for the same item, or it can be a sophisticated machine-learning process such as a decision-tree technique with a large number of inputs (degrees of freedom). Such models, generally speaking, look for patterns in the user's interaction behavior (i.e., interaction with a UI for making selections).

Detailed Description Text (71):
Referring to FIG. 12, a modification of the process of FIG. 6A allows a user to receive information through a fixed 120 or portable reader 100 and, in case the user chooses not to receive a response at that time or the portable reader 100 is unable to connect to the server 140, the response is delayed and continued later. Assume the user scans the MRL device T causing the reader 100/120 to acquire data from the MRL device T in step S10. In step S12, the reader 100/120 determines if it is able to connect with the network/Internet 130. If the reader 100/120 is connected, the interaction may be initiated between the reader 100/120 and the LAN server 150 or Network server 140 beginning with the transmission of data to the network server 140 at step S16. For example, the data transmitted may include data from the MRL device T plus other information, the other information including, for example, the identity of the user and/or certain profile data characterizing the user. Included with the information from the MRL device T may be a network address to which the reader 100/120 may connect to complete the information exchange. The interaction is continued as defined by the interaction process running on the server 110 at step S20. The data exchanged in the interaction may include data responsive to the acquired data, further user input, and/or data stored on the network server 140. Generally, it is contemplated that the interaction would be conducted in accord with, and by means of, a client-server process, for example using HDML (handheld device markup language), a markup language for small wireless devices or HTML (hypertext markup language).

Detailed Description Text (73):
In step S24, the status of the reader 100 may be ascertained. If it is connected and contains unprocessed stored data, having come through steps S14, S18, and S22, control passes to step S28 where the interaction or other interaction process that did not occur previously is initiated. Among the data transmitted in step S50 to the network server 140/150 may be the time since the HMDR device T was scanned. From this, the interaction process may determine whether it makes sense to direct the user to a sale within the store (if it has been only a short time since the scan). Again the interaction process may provide for alternate routing of information. For example, the user could request that relevant messages, coupons, etc. be sent by email, if possible.

Detailed Description Text (75):
Referring now to FIG. 13, in an example sequence that may occur according to the process of FIG. 12, the reader 100/120 acquires data from the MRL device T at step S40 and transmits it to an information supplier who has programmed the network server 140 at step S42. A message is generated by a software process (interaction process) running on the network server 140 which results in the reception of a message by the reader 100/120 at S46. The message is then output by the reader 100/120 at S48.

Detailed Description Text (76):
The data acquired by the reader 100/120 may include simply a unique identifier of the device or it could contain standardized symbols indicating product code, serial number, retailer to which the product was shipped, etc. The latter data, as indicated by brackets, however, may be derived from a unique identifier if the latter are correlated in a database of the information supplier. The data sent to the information supplier may include the date of scan, the time of scan, the scanner's (or person's) identity, and other information not derived from the MRL device T but available. The scanner identity may be unique or a code for a profile classification or may point to a particular profile without identifying the scanner explicitly. Again, the profile data could also be sent by the reader 100/120.

Detailed Description Text (78):

Referring now to FIG. 15, yet another sequence begins with the acquisition of MRL device T data at S30. The data is stored at S32. At some later time when the reader 100/120 is connected, the stored data is sent to the information supplier at S34. The information supplier sends a message which is received at S36 and sent to the reader 100/120. At some time later upon an event indicating it is a good time for the delayed interaction, the message is output to invite the user to begin interacting with the information supplier at step S38. The message may be a simple invitation or may indicate some feedback based on the data sent at S34, such as a menu of options defined at the beginning of the interaction process.

Detailed Description Text (80):
The dialog may take place at a later session in response to an email as follows. The user indicates at S76 that he/she wants to participate in the interaction at a later time to be initiated by the user by selecting an HTML link in an email message. (obviously, the invitation need not be so complicated, for example, the user may be presented at 40 with a selection labeled: "Send email alert to learn about <product> later.")

Detailed Description Text (81):
The dialog may take place later through a targeted TV advertisement or interactive TV session as follows. (For purposes of the present discussion, these may be essentially the same as a terminal connected to the Internet, a television and set-top box being essentially its equivalent.) The user selects an option for TV delivery and the interaction is scheduled to take place at time when the user's TV is active (or at some time selected by the user). Other alternatives corresponding to S78 include the user indicating a desire for a telephone or personal sales call, or regular postal delivery of information.

Detailed Description Text (82):
Note that the process at S78 may occur on the portable terminal, on a stationary appliance, such as one located at a retail premise, or on any other device. Referring to FIG. 17, the determination of a good time for beginning or continuing a delayed interaction, information delivery, or transaction may be determined by a fixed time delay S301, an event indicating the user is at a particular location or involved in a predetermined activity S302, the synchronization of a portable reader with a stationary terminal S303, or simply a random time S304. When any of these events S301, S302, S303, S304 occurs, a request for service is initiated at step S310 and the interaction process is continued or begun. For example, the user may access an Internet portal and receive the message in response to logging in or the user's cookie correlated with the identity data transmitted at S74. Stored data corresponding to a delayed interaction may be given an expiration time and date and caused to expire after the passage of that time S305. In that case, an alternative process can be performed S305 such as giving the user the option of delaying the interaction further, emailing a message, etc. The data and the incipient interaction may be purged by either the reader 100/120 or the network server 140.

Detailed Description Text (83):
Whereas in the above embodiments, the invention was described in terms of information exchange, it is contemplated that these exchanges could trigger actions as well. For example, one result of the interaction process could be the online purchase of a product. Also, the interaction need not occur on the reader 100/120 that sent the data. The interaction may take place through a connection to the information supplier provided by a different appliance such as one of the appliances 170-190. One way to initiate the interaction through the alternate appliances is by scanning the MRL device T with a scanner of the appliance. Another may be by synchronizing the reader 100 with the appliance where, for example, the message received at 34 is conveyed to the appliance along with other data required to complete the interaction, if necessary according to the interaction process.

Detailed Description Text (88):
Referring to FIG. 20, a process for generating messages on the UI of a reader in the absence of a scanning event begins with detection of the presence of a user in step S405. Alternatively, the loop of FIG. 20 can be run continuously or on an intermittent schedule or scheduled in some other way. In step S407, a resource is automatically requested by the reader and a response received. The request may be generated from user preference data. In step S410, the resource received is compared to the user preference data and rejected, in which case control passes to step S405 or accepted in whole or in part, in which case it is delivered in step S415 and control returns to step S405. Note that delivery of the resource may involve the initiation of

the interaction or some automatic process or simply the delivery of information, like an advertisement.

Detailed Description Text (91):
Referring to FIG. 22, a procedure for providing various features using a ticket stub, coupon, receipt, or other paper document having a MRL device attached. As mentioned with reference to FIGS. 3 and 4, a ticket stub or other document may have a MRL device affixed to it. These documents or coupons may provide a valuable marketing device, for example. A user seeing a movie may scan his/her ticket stub at a kiosk located at the movie theater and rate the movie s/he just saw, purchase goods related to the movie, and do other things. While it has been proposed that bar-codes be used on a ticket stub to connect users to web sites for purchase of goods, this degree of automation merely avoids the need for the user to enter a web address. The present idea is to make the purchase or entry of information into a preference database very easy and quick. There is a much greater likelihood of a sale when a user is provided an opportunity to buy a movie soundtrack just as the user leaves the movie with the music still fresh in his/her mind. The smaller the number of steps involved, the more likely a sale will be completed. In an embodiment of the invention, a MRL device is attached to a ticket stub. The device may contain a resource address at which the movie soundtrack can be purchased. Moreover, the device contains sufficient data density to correlate or store account, authorization, shipping, and authentication information to allow the purchase to be completed without any prompting from the user aside from the selection and confirmation of an item to be purchased. If a theatergoer purchases tickets using a credit card, the account can be linked temporarily to data on the MRL device on the ticket stub. This data can further link an order process to preference information contained in the user-profile database and the purchase used to augment that database. To protect the user's account, the connection between the user's credit account and the ticket data may be given a predefined expiration period, say 2 hours after the movie or other event is over. As an inducement for the user to purchase at the theater, the user can be given a discount incentive such as lower price on his/her next ticket purchase, discounted price for the goods ordered, or a free gift. Precisely the same functionality can be provided through a home computer connected to the Internet or a portable terminal rather than a kiosk terminal.

Detailed Description Text (93):
In step S475, the user scans his document at a terminal, for example a kiosk at an entertainment venue. In step S480, the user is prompted for input, such as a selection of a product for purchase, an evaluation of an event just enjoyed, etc. The user's authorization information is processed by a server in step S485 and a response generated which may include the invitation for additional requests, confirmation of sale, etc. Further transactions may be invoked and appropriate UI elements generated in step S40. In step S480, preferably an authentication step is involved to insure that a lost document is not used by a finder. The association in step S470 may be given a time to live (TTL) so that after the expiration of some predefined interval of time, the document and MRL device can no longer be used. By forming an association between the user's account and the MRL device's unique code, purchases and other authorization-requiring transactions can be completed quickly. The registration process in step S468 is analogous to the creation of a temporary credit card in the MRL device. As mentioned, however, it is preferable under most circumstances to attach an authentication requirement such as biometric or entry of a personal identification number (PIN) or symbol.

Detailed Description Text (94):
The registration process that associates an account with a ticket MRL may be done at a residence before going to the entertainment venue over the Internet. Currently, there are proposals for systems in which a user can purchase a ticket and print it, with a bar-code, on a printer at home. The ticket is then scanned at the theater to authorize the user. This same thing could be done with a MRL device. The user stores an association between an account and a MRL ("blanks" may be distributed free or for a nominal fee) by scanning the MRL at home and performing a secure transaction. The association with the account that permits the ticket to be used for purchases may impose a spending limit. A parent could prepare and give a ticket to a child that permits the child to attend the movie and make limited purchases. For example, the child could buy a recording or treats at the theater using the MRL as a temporary expense-limited charge device.

Detailed Description Text (101):
The procedure of FIG. 24 begins with a large number of low-confidence results being returned by

a search process in step S310. In step S315, discriminants are identified in the search results and selected for relevance to the user's state in step S320. If there are any discriminants that are identified as relevant S325, a question is presented to the user in step S330, input is received in step S335 and a new query generated in step S340. If no relevant discriminants are found, the attempt may be aborted, or a more user interaction-intensive process based on arbitrary discriminants followed. Relevance of discriminants may be determined by consulting the user preference base. Since queries may not contain much information from the preference profile, the candidate discriminants may be used as a probe of the profile database to identify profile content that may be relevant to the search. Lexical dictionaries may be used in this context to expand terms in the profile.

Detailed Description Text (105):
Referring to FIG. 29, as discussed above, it is preferable that there be as few exceptions to types of articles for which the MRL system may be used. For example, it would be a disincentive to adopt an automated system for food inventory maintenance if some things in the food inventory could not be updated automatically. Consumables could be a problem in this regard since MRL devices may not be programmable at the time and location of the preparation of a consumable, for example a tub of potato salad. Beginning with a registration step at S605, a preprogrammed MRL device having a unique identifier and information identifying and characterizing the consumable item, including an initial quantity, are stored in step S610. Then when a scan event occurs S615, the user receives a response or responses in any of the fashions described above, as appropriate. The user is given the option of updating quantity in step S620. If the user elects to do so, the user updates the quantity data in step S625 which is then stored in the correlation resource or database. If the consumable item is used up or some time to live parameter expires (e.g., potato salad has been stored long enough as to become unusable) S626, the thread is deleted and the data (correlation) thrown out. Note that the above procedure may be applied to items whose conditions change over time rather than items that are consumed. For example, a tomato plant may change over time increasing a food inventory. Also, the items may be non-food items such as lumber (e.g., board feet remaining) or pounds of nails. Also, MRL devices may be attached using any suitable means, for example MRL devices may be created with adhesive backing or with reusable ties attached to them. MRL devices may also be molded into containers or permanently affixed to them. A display stand may hold MRL devices near produce items or they may be formed into the plastic bags that are often made available in supermarket produce areas. The data identifying the consumable can be stored by a checkout register in a store as an additional output of a vendor's inventory and/or purchase tracking. Alternatively, there may be stations that permit the user to enter the relevant information as in many European supermarkets where users weigh produce and make a selection at a terminal to print a bar code. The correlation data could be generated in the same way.

Detailed Description Text (107):
As discussed above, it does not matter where the correlation or other data is stored physically. Networks and Internet may connect one data object to a process just as a data bus connects physical memory or non volatile storage to a processor. Thus, in this discussion and elsewhere, where no particular mention is made of where data is stored, it is assumed not to matter and that a person of ordinary skill could easily make a suitable decision about where to store data--on a vendor's server, on a reader, at a home network server, on a third party server, etc. Thus, profile data may "follow" a user wherever the user goes. So if a user uses a reader in a public place, the user's personal profile is accessible to the processes the user employs. This assumes appropriate security devices are in place to protect the user's profile data. Also note that it has been assumed in the discussions above, in most cases, that some sort of UI, such as those built into a handheld organizer with a touch screen, is associated with the readers discussed to allow data to be displayed and entered. The UI could be part of the device to which the reader is attached or with which it is associated or it could be part of the reader. The details of the UI are not important, except as otherwise noted, and could be of any suitable type at the discretion of a designer.

CLAIMS:

8. A method for tracking descriptive information about a changeable article, comprising the steps of: attaching a machine-readable label (MRL) to an article; said MRL having a unique code; storing a correlation between descriptive information about said article and said unique code in a data store; and reading said unique code to obtain at least a portion of said

descriptive information using said correlation in said data store; deleting said correlation after the passage of a predetermined period of time after said step of storing.

10. A method as in claim 8, further comprising the step of reading said unique code, looking up said correlation responsively to said unique code, and modifying at least a portion of said descriptive information responsively to said correlation in said data store.

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